

maxillary barbel as long as head. Vomerine teeth in a narrow band, without posterior process.

*Synodontis multipunctatus*, sp. n.—Mandibular teeth in a single series of 16, nearly straight, simple, measuring hardly  $\frac{1}{3}$  diameter of eye; depth of body  $3\frac{1}{4}$  in total length; snout rounded, twice as long as eye; maxillary barbel reaching a little beyond anterior third of pectoral spine; dorsal spine serrated behind; adipose fin a little shorter than the head, twice as long as its distance from the dorsal; humeral process sharply pointed.

#### CYPRINODONTIDÆ.

*Haplochilus tanganicanus*, sp. n.—Body compressed, its depth 4 times in total length: D. 13; A. 26; Sq. 42; l. tr. 11.

Diagnoses of two new genera of *Cichlidæ* were also added, based on specimens forming part of a collection made in Tanganyika by Capt. Descamps, of the Congo Free State:—

*Ectodus*, g. n.—Teeth very small, conical, in two series in both jaws, the outer larger; outer mandibular teeth pointing outwards, perpendicular to the others; maxillary concealed under the præ-orbital when the mouth is closed. Scales rather large, ctenoid.

*E. descampsi*, sp. n.—D. XIV 14; A. III 8; Sq.  $34\frac{3}{10}$ ; l. lat.  $\frac{23}{15}$ . Eye very large,  $2\frac{1}{5}$  times in length of head.

*E. melanogenys*, sp. n.—D. XIV 16; A. III 13. Eye 4 times in length of head.

*Plecodus*, g. n.—Teeth large and few, in a single series, dilated at the base, truncated at the end, compressed, slightly grooved in front, curved and directed backwards; 14 teeth in upper jaw, 12 in lower; maxillary exposed. Scales moderate, cycloid.

*P. paradoxus*, sp. n.—D. XIX 14; A. III 12; Sq.  $65\frac{6}{17}$ ; lat. l.  $\frac{50}{40}$ .

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The following papers were read:—

1. On the Scorpions, Spiders, and Solpugas collected by Mr. C. Steuart Betton in British East Africa. By R. I. Pocock, of the British Museum of Natural History.

[Received May 28, 1898.]

(Plates XLI. & XLII.)

On his return to England in the summer of 1897, Mr. Betton, a member of the staff of engineers employed in the construction of the railroad now in process of being laid between Mombasa and Lake Victoria, brought home a valuable series of zoological specimens and generously presented them to the Trustees of the British Museum.

The Arachnida, which came into my hands for determination and form the subject-matter of the present communication, proved upon examination to be of very considerable interest; for not only was there a large percentage of new forms amongst them, but the series contained as well examples of several species, which, though already described by continental authors, were not at the time represented in the National Collection.

Of the Scorpions none were new to science; but of the species known as *Pseudobuthus dentatus* there were no specimens in the Museum at the time; and of the little flat black species named *Iomachus politus*, of which a large series of adults and young of both sexes were obtained, we only possessed a solitary example (the *type*), sent some years previously from Mombasa by Mr. Wilson. The rest of the Scorpions, though not in any way novelties, form valuable additions to our series.

So far as "*species novæ*" are concerned, the Solpugas (Solifugæ) contrast very forcibly with the Scorpions, since out of the six species sent home, one only appears to have been already named. The rest are representatives of well-known African genera.

Of the Spiders nearly all the Theraphosidæ appear to be representatives of new species, the most interesting being the specimen of the new genus *Eucratoscelus* and the series of examples including the previously unknown male of *Pisenor höhneli*. Most of the Argiopidæ are well-known forms of wide distribution in tropical Africa; but specimens of the protectively coloured and fantastically shaped genera *Poltys* and *Cerostris* seem to be referable to species which have hitherto escaped the vigilance of collectors in that part of the world. The capture of a male of the species of *Cerostris* is a feat upon which Mr. Betton is to be especially congratulated.

## Order SCORPIONES (SCORPIONS).

### Family SCORPIONIDÆ.

#### Genus SCORPIO Linn.

##### ? SCORPIO BELLICOSUS L. Koch.

? *Scorpio bellicosus*, L. Koch, Aegyptische und Abyssinische Arachniden, p. 1, pl. i. fig. 1 (1875).

*Loc.* Ndi (Weiss Road Camp).

A single female example collected by Mr. Betton resembles the females obtained in Somaliland by Dr. Donaldson Smith, which I have identified as *Scorpio bellicosus* of L. Koch. The accuracy of the determination, however, must remain a matter of doubt until the male is procured or until the genuine female of *bellicosus* comes to hand for comparison.

##### SCORPIO GREGORII Pocock.

*Scorpio gregorii*, Pocock, Ann. Mag. Nat. Hist. (6) xvii. p. 432, pl. xviii. fig. 2.

*Loc.* Ndi (Weiss Road Camp).

This species will in all probability prove to be identical with the form previously described by Dr. Kraepelin as *Sc. pallidus*, from Sumatra. The locality "Sumatra" is almost certainly erroneous.

Dr. Gregory obtained the species at Tzavo, Kinani, &c.

#### Genus IOMACHUS Poc.

##### IOMACHUS POLITUS Pocock.

*Iomachus politus*, Pocock, Ann. Mag. Nat. Hist. (6) xvii. p. 317 (1896); Kraepelin, Jahrb. Hamb. Wissen. Anstalten, xiii. p. 138, figs. 19-22.

*Loc.* Maziwa Mitatu, Machuma, Mbuyuni, Voi, and Samburu.

Though this little flat Scorpion is evidently abundant near Uganda, the species was hitherto represented in the British Museum by a single young specimen, the type, obtained by Mr. Wilson at Mombasa. Prof. Kraepelin has recorded the species from Dar es Salam and Bagamoyo.

#### Family BUTHIDÆ.

##### Genus BUTHUS Leach.

##### BUTHUS EMINII Pocock.

*Buthus eminii*, Pocock, Ann. Mag. Nat. Hist., July 1890, p. 98, pl. i. fig. 2.

*Loc.* Voi.

Also obtained by Dr. Gregory at Ndara and Athi and by Emin Pasha on the shores of Lake Victoria Nyanza.

#### Genus PARABUTHUS Poc.

##### PARABUTHUS PALLIDUS Pocock.

*Parabuthus pallidus*, Pocock, Journ. Linn. Soc., Zool. xxv. p. 312.

*Loc.* Machuma in the Taru desert.

Previously recorded from Mombasa (*D. J. Wilson*), and Giriama near Fuladoya (*J. W. Gregory*).

#### Genus PSEUDOBUTHUS Poc.

##### PSEUDOBUTHUS DENTATUS (Karsch).

*Odonturus dentatus*, Karsch, Sitzb. nat. Fr. Berlin, 1879, p. 119.

*Rhoptrurus dentatus*, id. Berl. ent. Zeit. xxx. p. 77 (1886).

*Pseudobuthus dentatus*, Kraepelin, Jahrb. Hamb. Anst. xiii. p. 121 (1896).

Males, females, and young of this species, which is new to the British Museum collection, were taken at Samburu, Machuma, Mbuyuni, and Voi. The adults, measuring about 70 mm. in length, are mostly of an earthy-red colour with an indistinct median dorsal line; but a young example (40 mm.), which has the aspect of a distinct species, is yellower, with the dorsal surface trilineate; the humerus, brachium, and manus of the chelæ, as well as the femora

and patellæ of the legs, are blotched with black, and the lower surface of the tail has a median dark line and a pair of fuscous patches on each side of it.

This species, the type and only known representative of the genus *Pseudobuthus*, may be compared with the type and only known species of the genus *Tityobuthus* as follows:—

- a. Vesicle of tail smooth and punctured below, tooth below aculeus small; 5th and 4th segments of tail at most weakly granular below, not crested; last abdominal sternite not crested; 2nd caudal segment with median lateral crest almost complete; brachium of chela and homologous segment of legs (patella) not crested; densely variegated.

*Tityobuthus haroni* (Poc.). Madagascar.

- b. Vesicle of tail granular below, tooth long; 4th and 5th segments of tail and last abdominal segment distinctly crested below, brachium of chela and patella of legs also crested; 2nd caudal segment without median lateral crest; prevailing colour yellow or red, weakly infusate.

*Pseudobuthus dentatus* (Karsch).

### Genus ARCHISOMETRUS Kraepelin.

#### ARCHISOMETRUS BURDOI (Simon).

*Isometrus burdoi*, Simon, Bull. Soc. Ent. Belg. 1882, p. lviii; Pocock, Journ. Linn. Soc., Zool. xxiii. p. 443, pl. xi. fig. 5 (1890).

*Loc.* Voi.

Previously known from Lake Nyassa, Kilimanjaro, &c.

### Order ARANEÆ (SPIDERS).

#### Family THERAPHOSIDÆ.

#### Subfamily HARPACTIRINÆ.

*Harpactirinae*, Pocock, Proc. Zool. Soc. 1897, p. 748.

#### Genus EUCRATOSCELUS, nov.

Allied to *Pterinochilus*, but differing in having the legs of the 4th pair much longer than those of the 1st, the patella and tibia of the 4th being also much longer than those of the 1st; the tibia being very stout and hairy, its width exceeding a third of its length and being at least as wide as the distal end of the femur. In *Pterinochilus*, on the contrary, the 4th leg is only a little longer than the 1st, with patella and tibia not longer (? always shorter) than those of the 1st, the tibia itself being normally hairy, slender, cylindrical, and narrower than the femur.

Type, *E. longiceps*.

#### EUCRATOSCELUS LONGICEPS, sp. n.

*Colour.* Carapace and limbs covered with a clothing of short greyish-brown hairs, the setæ reddish brown, the lines on the legs paler; distinct whitish tufts or bands at the extremities of the femora, patellæ, tibiæ, and protarsi; abdomen a deep chocolate-brown, with reddish bristles; sternum and coxæ blackish, with greyish hairs.



*Carapace* moderately high in the head-region, its width less than three-quarters its length ( $13:18\frac{1}{2}$ ); length exceeding that of patella and tibia of the 1st leg by one-third of the protarsus, a little less than those of 4th leg, equal to patella, tibia, and tarsus of palp, less than tibia, protarsus, and tarsus of 2nd leg by at least half the tarsus; length from fovea to anterior border equal to 4th protarsus; width a little less than patella and tibia of 2nd leg and a little greater than those of 3rd leg. Eyes as in *Harpactira*; tubercle high, nearly spherical; distance between the anterior lateral eye and the edge of the clypeus exceeding the long diameter of the eye.

*Mandibles* with nine large teeth and smaller granuliform teeth.

*Labium* with about three rows of spicules.

*Palpi*, when extended, just surpassing the tip of the tibia of the 1st leg; unarmed, except for one spine below at the apex of the tibia.

*Legs* (from the base of the femur) 4, 1, 2, 3; the 3rd falling short of the 2nd by two-thirds of its tarsus, the 2nd falling short of the 1st by about half its tarsus, the 1st less than the 4th by its tarsus and about one-fourth of its protarsus, the 4th exceeding the 3rd by its tarsus and three-fourths of the protarsus; a pair of apical spines on the lower surface of the tibia and a median spine at the apex of the protarsus of the 3rd and 4th; patella and tibia of 4th exceeding those of the 1st by almost half the protarsus, about equal to the tibia, protarsus, and tarsus of the 3rd leg, which are very slightly longer than the protarsus and tarsus of the 4th; tibia and protarsus of 1st a little shorter than protarsus and tarsus of 4th; tibia of 1st a little longer than the protarsus, a little more than twice as long as broad; tibia of 4th a little shorter than the protarsus, its width rather more than one-third of its length; width of 4th protarsus about one-fourth of its length.

*Measurements in millimetres*.—Total length of body 42, of carapace 18.5, width of latter 13, length from fovea 12; length of palp 27.5, of 1st leg 43, of 2nd 40, of 3rd 36, of 4th 52.5; patella and tibia of 1st 15.5, of 4th 18.8; width of tibia of 1st 3, of 4th 4.

*Loc. Voi*. A single female example of this interesting new Spider was obtained.

#### Genus PTERINCHILUS Pocock.

##### PTERINCHILUS MURINUS Poc.

*Pterinichilus murinus*, Pocock, Proc. Zool. Soc. 1897, p. 753, pl. xliii. fig. 4.

The type of this species was a rather mutilated female example from Ugogo (Emin Pasha). Female specimens were also recorded from Mombasa and the north-east shore of Victoria Nyanza. These examples prove to be not quite full-sized. I am therefore glad of the opportunity to point out further specific features observed in the well-preserved material obtained by Mr. Betton at Ndi, Mbuyuni, and Machuma.

The largest female measures 39 mm. long, the carapace being 19 long and 18·5 broad.

The carapace is covered with golden hairs, showing a more or less radial arrangement in stripes; the abdomen is yellowish or greyish brown, symmetrically spotted and striped above.

The carapace is a little longer than the patella and tibia of the 4th and 1st legs (in smaller examples, as in the type, it is about equal), and about equal to tibia and protarsus of 1st (in young examples a little greater). The spine armature of the legs is as in the type.

*Measurements in millimetres of largest example.*—Total length 39; length of carapace 18·5, width 15·5; length of 1st leg 49, 2nd 45, 3rd 41, 4th 51, palpus 31.

In addition to the examples mentioned above that were obtained on the Uganda-Mombasa Railway, the British Museum has recently received an adult female from Portuguese E. Africa. The species evidently, therefore, has a wide distribution in eastern equatorial Africa.

*PTERINOCILUS SPINIFER*, sp. n. (Plate XLI. figs. 1, 1 a.)

♂. *Colour.* Carapace and mandibles black, but somewhat thickly covered with golden-yellow hairs; legs also blackish, but covered with golden hairs, intermixed with grey and blackish; the extremities of the femora, patellæ, tibiæ, and protarsi whitish; abdomen golden yellow at the sides, passing into black on the dorsal middle line, the black especially conspicuous posteriorly; lower surface of abdomen greyish yellow; sternum and coxæ blackish with yellowish long hairs.

*Carapace* convex, its width more than two-thirds of its length; length much less than that of tibia and patella of 4th leg, scarcely equal to protarsus of 4th, a little less than patella and tibia of 2nd, greater than those of 3rd, less than protarsus and tarsus of 3rd, about equal to patella, tibia, and tarsus of palp; its width a little less than tibia of 4th, equal to protarsus of 1st, slightly greater than tibia of 1st, much less than patella and tibia of 3rd. Ocular tubercle nearly spherical; clypeus narrow, less than one-fourth the length of the tubercle; space between the edge of the clypeus and the anterior lateral eye about equal to its long diameter.

*Legs* 4, 1, 2, 3, the 4th exceeding the 1st by two-thirds the length of the tarsus, patella, and tibia of 4th, a little greater than those of 1st, equal to protarsus and tarsus of 1st; tibia of 1st very thick, the thickest segment in the limb, its width at least equal to one-third of its length, the spine long and strong; protarsus bowed as in *P. vorax*, but armed below at its distal end with a strong tuberculiform spike; tibia armed below distally with a pair of apical spines; protarsi of 3rd and 4th with a few apical spines and with one median external spine, of 4th with one superior distal spine.

*Measurements in millimetres.*—Total length 20; length of carapace 9·5, width 7·5; length of 1st leg 34·5, of 2nd 31, of 3rd 27,

of 4th 37.5; patella and tibia of 1st 11.5, of 4th 12; protarsus of 4th 10.

*Loc.* Mbuyuni. A single male example.

Much smaller than *P. vorax* Poc. (P. Z. S. 1897, p. 752), with relatively much longer legs &c. For example in *vorax* the carapace is just about as long as the patella and tibia of the 4th legs, and its width is greater than the protarsus of the 4th; there is, moreover, no spine upon the protarsus of the 1st, and the tibia is not thick as in *spinifer*.

The males of the three known species of *Pterinochilus* may be distinguished as follows:—

- a. Protarsus of 1st leg with a distinct tuberculiform tooth below near the apex, tibia of 1st leg thicker than the femur; legs longer; carapace less than patella and tibia of 2nd leg and less than 4th protarsus, &c. .... *spinifer*, sp. n.
- b. Protarsus of 1st leg without tuberculiform tooth, tibia of 1st not thicker than its femur; legs shorter; carapace exceeding patella and tibia of 2nd leg, and much longer than protarsus of 4th.
  - a'. Of large size (carapace about 16 mm.); protarsus of 1st leg basally sinuate; carapace much longer than patella, tibia, and tarsus of palp; spine of palpal organ simple and attenuate ..... *vorax* Poc.
  - b'. Of small size (carapace 10 mm.); protarsus of 1st leg straight; carapace not longer than patella, tibia, and tarsus of palp; spine of palpal organ with a strong upstanding crest and a blunt point. .... *nigrofulvus* Poc.<sup>1</sup>

#### Subfamily EUMENOPHORINÆ.

*Eumenophorinæ*, Pocock, Proc. Zool. Soc. 1897, p. 773.

#### Genus PHONEYUSA Karsch.

PHONEYUSA BETTONI sp. n.

Closely allied to *P. gregorii*, Pocock (P. Z. S. 1897, p. 761).

Hairy coating a bright reddish brown, with conspicuous pale narrow tufts at the tips of femur, patella, tibia, and protarsus of legs; the lines on the legs reddish.

Width of *carapace* more than three-fourths of its length; its length only a little greater than that of patella and tibia of palp, equal to length of patella and tibia of 2nd leg, a little less than protarsus and tarsus of 1st or 2nd, these two being about equal; very slightly exceeding 4th protarsus; its width slightly exceeding tibia and tarsus of palp and a little less than patella and tibia of 3rd leg; distance between fovea and anterior edge scarcely equal to 3rd protarsus, and slightly exceeding protarsus of 1st and 2nd.

*Palp* when extended reaching nearly to the apex of tibia of 1st leg, unspined, its tibia about four times as long as broad, a trifle longer than that of the 2nd leg, nearly twice as long as patella of palp and three times as long as its tarsus; the bulb of the same form as in *gregorii*.

<sup>1</sup> Poc. Ann. & Mag. Nat. Hist. (7) i. p. 317. From the Transvaal.



*Legs* 4, 1, 2, 3 (from base of femur), 4th surpassing 1st almost by length of its tarsus; 1st surpassing 2nd by half its tarsus, 2nd surpassing 3rd by less than half its tarsus, 4th surpassing 3rd by its tarsus and one-third of its protarsus; patella and tibia of 1st and 4th about equal; protarsus of 4th almost equal to patella and tibia of 2nd; tibia of 4th without inferior distal spines, of 3rd with one anterior distal spine below; tibia of 2nd and 1st with a pair of inferior distal spines; protarsus of 1st with two, of 2nd with three, of 3rd and 4th with four inferior apical spines.

*Measurements in millimetres.*—Total length of trunk 38, of carapace 18.5, from fovea to anterior border 12.5; width of carapace 16; length of palpus 34.5, of 1st leg 60, of 2nd 56, of 3rd 52, of 4th 68.5, of patella and tibia of 1st and 4th 22, of 4th protarsus 18.

*Loc. Voi.* A single male example.

This species and *P. gregorii* may be distinguished as follows:—

- a. Palp shorter; the carapace equal in length to its patella, tibia, and tarsus, its tibia not so long as that of the 2nd leg, its width more than one-fourth of its length; tibiae of 3rd and 4th legs with a pair of apical spines below ..... *gregorii* Poc.
- b. Palp longer; carapace only equalling its patella and tibia, its tibia slightly longer than that of the 2nd leg and four times as long as broad; tibia of 4th leg without inferior spines, that of the 3rd with one inferior distal spine ..... *bettoni*, sp. n.

In connection with this species it is interesting to observe the absence of inferior spines upon the tibia of the 4th leg, since this feature was mentioned by Karsch in his diagnosis of *Pelinobius* as serving to distinguish that genus from the previously established *Phoneyusa*. But, in spite of a strong suspicion I venture to entertain that *Pelinobius* will prove to be synonymous with *Phoneyusa*, I refrain from definitely uniting the genera, since M. Simon declares the arrangement of the eyes to be different in the two. The type of *Pelinobius*, namely *muticus*, was from Masailand (see JB. Hamburg. Wissen. Anst. ii. p. 135, 1885); but although agreeing in the main with both *gregorii* and *bettoni*, it is certainly the representative of a totally distinct species, if any reliance is to be placed upon the figure and description. The legs, for example, are said to be without spines, and they are evidently shorter as compared with the size of the carapace; for example, the width of this plate is equal to the length of the 4th protarsus.

## Family BARYCHELIDÆ.

### Genus PISENORODES, nov.

Allied to *Pisenor* Simon, but differing apparently in the structure of the tarsus of the palp in the male. The tarsus is long and slender, three times as long as wide, nearly as long as the tibia of the palp, scopulate, but not bilobed at the apex, the papal bulb arising from the base of its lower side.

This new genus is proposed for the reception of the species,



represented by male and female examples, obtained by Mr. Betton and believed to be identical with the form named *P. höhneli* by Simon.

The type of *Pisenor* is a species from the Zambesi, named *notius* by Simon (Act. Soc. Linn. Bord. xlii. p. 411, 1889). The male of it is as yet unknown, and it may consequently prove to have the same sexual features as the genus here established. In that case *Pisenorodes* will lapse as a synonym of *Pisenor*. But Simon has described the male of a second species, which he refers to *Pisenor*, namely *P. nigellus* (*loc. cit.* p. 411), from Landana, Congo; and the tarsus of this species is described as small, narrow, and bilobate, being apparently constructed much as in the allied genus *Idiomata*, and in the genera of Theraphosidæ. In that case *P. nigellus* can hardly be congeneric with the species here identified as *höhneli*; and since it has been definitely referred to *Pisenor*, it appears to me advisable to establish a new genus for the species now before me. If this species be wrongly determined it must have a new specific name and can still be regarded as type of this new genus.

*PISENORODES HÖHNELI* (Simon). (Plate XLI. figs. 2-2 b.)

*Pisenor höhneli*, Simon, Ann. Soc. Ent. France, 1889, p. 125.

Recorded from Kilimanjaro by Simon. Mr. Betton obtained specimens at the following localities:—Samburu and at Taru, Maziwa ya Tagari and Machuma in the Taru desert.

The female examples I am unable to separate from the female of *höhneli* as described by Simon. But since the male is new to science, the following particulars regarding it may be mentioned:—

The *carapace* is as long as the patella and tibia of the 4th leg and the tarsus and protarsus of the 1st, slightly shorter than patella and tibia of the 2nd, and distinctly shorter than protarsus of 4th, about equal to patella, tibia, and tarsus of the palp; its width is almost as great as its length.

*Legs* 4, 1, 2, 3; protarsus of 4th longer than protarsus and tarsus of 1st; tibia of 1st armed distally with an inferior process tipped with a single strong spine, above and behind this is a second very stout, slightly curved spine, and in addition to these the segment is armed with about eleven long slender spines; the protarsus is slender and lightly bowed and armed with 1 (2) external basal spines. *Palp* projecting halfway along the tibia of the 1st leg when extended, its femur spined at the apex on the inside; its patella with two short basal spines on the inner side; tibia with about five spines on the inner side, thickly hairy below, with a naked median channel for the reception of the palpal spine, while the distal end is hollowed beneath for the reception of the bulb; *palpal bulb* subglobular, the spine longish, straight, with a bent tip, broad, more or less spatulate, slightly constricted at the base, with a slight spiral twist. Femora, patella, and tibia of all the legs spiny.

*Mandible* armed with a single internal row of nine large teeth and a few small granules posteriorly. *Maxilla* lightly depressed at the

base, with a few cusps; *labium* with a row of four cusps. *Sternal sigilla* marginal.

*Measurements in millimetres.*—Total length of trunk 22, carapace 10·5; width of carapace 9·5; length of palpus 16·5, of 1st leg 32, 2nd leg 30·5, 3rd leg 28, 4th leg 37, patella and tibia of 1st 12, of 4th 10·5.

The species described from Moschi as *Idionmata lepida* by Gerstäcker (Von der Decken's Reisen in Ost-Afrika, iii. 2, p. 485) was based upon a male example which, as suggested by Simon, perhaps belongs to the genus *Pisenor*; in any case it is certainly different from the male here identified as *Pisenorodes höhneli*. In the first place, it is very much smaller, the body and mandibles measuring only 12·5 mm. in length, and there is not a word in the description to credit the belief that the tarsus of the palp and the tibia of the 1st leg are constructed as in the species I have here described.

#### Family CTENIZIDÆ.

##### Genus CYRTAUCHENIUS Thorell.

##### CYRTAUCHENIUS FLAVICEPS, sp. n.

*Carapace* with its head-region clear reddish yellow, with a fine median fuscous line studded with a series of setiferous pores; the head bordered by a broad brown band on each side, which passes back to the fovea; sides of the thoracic portion paler than the median portion; mandibles, palpi, and anterior two pairs of legs dark brown; 4th leg a little paler; abdomen a uniform greyish brown; sternum and coxæ yellowish.

*Carapace* as long as patella and tibia of 4th leg, and as patella, tibia, and half the protarsus of the 1st, its width equal to protarsus and tarsus of 4th leg; length from fovea to anterior border equal to tibia of 4th. *Ocular area* more than twice as broad as long; the eyes of the posterior line wider than those of anterior, of which the lateral are close to the edge of the clypeus. Eyes of anterior line procurved; a line touching the anterior border of the medians would pass behind the centres of the laterals; space between anterior medians equal to about half their diameter; laterals larger than medians and larger than posterior laterals, which are quite close to the posterior medians.

*Rastellum* consisting of strong spines overhanging the base of the fang; internally some of these fangs are longer and arranged more thickly, externally they are shorter and form a single series; lower margin of mandible with an inner series of about nine teeth, the external row consisting of a series of granules; fang longish. *Labium* and *maxillæ* unarmed, bristly.

*Legs* longish and slender, except those of the 3rd pair, which are shorter and have the femur and patella thick: 1st leg with a single median apical spine on the tibia, and two spiniform setæ behind it, and 7 inferior spines on the protarsus amongst the scopular hairs, arranged approximately 2, 2, 3, the latter being at the apex; 2nd

leg spined like the 1st, with one or two shorter protarsal spines; 3rd leg with patella rather thickly spiny in front, bristly above, with 1 posterior apical spine, tibia with 2 spines in front, 2 behind, 4 above; protarsus with 2, 2, 3 spines below and about 14 spines above—5 forming an anterior, 8 a posterior series, and 1 median dorsal; tarsus with 1, 1 spines above; 4th leg with tibia bearing 1 posterior spine and a few setiform spines below, its protarsus armed with numerous spines in front below, those at the apex being long and strong, and two spines behind, one median, one apical; tarsus with many short spines on the anterior side of the lower surface. *Claws* with two rows of strong teeth, those of the 3rd and 4th legs less strongly toothed than those of the 1st and 2nd. *Mamillæ* longish, the apical segment acuminate, but little shorter than the second.

*Measurements in millimetres.*—Total length of trunk 18; length of carapace 8; width 5·5; length from fovea 5; length of palp 11, of 1st leg 17, of second 14·5, of 3rd 11, of 4th 18·5, patella and tibia of 1st 7, of 4th 8.

*Loc. Voi.* A single female example.

The generic position of this species must at present be left unsettled. In a general sense it falls under *Cyrttauchenius* as defined by Simon. In the structure of the mamillæ it seems to resemble *C. zebra* of Simon, from Zululand (Ann. Soc. Ent. France, lxi. p. 272, 1893), but in other characters, such as size of eyes, spine-armature of anterior tibia and of 3rd tarsus, it approaches *C. terricola*.

#### Genus ACANTHODON Guérin.

##### ACANTHODON ROBUSTUS, sp. n.

*Colour* of carapace brownish yellow; legs darker, with fuscous longitudinal stripes; inner surface of femora of palpi and first two pairs of legs pale yellow.

Length of carapace exceeding that of tibia and protarsus of 4th leg (in *lacustris* it is greater). Ocular arrangement almost as in *lacustris*<sup>1</sup>, but the ocular area shorter, the width across the tubercle exceeding the length from the posterior border of the tubercle to the anterior tubercle of the anterior lateral eyes (in *lacustris* the length of the area slightly exceeds the width of the tubercle); width of ocular area at least half the length of the 4th protarsus.

*Labium* with a transverse row of 4 or 5 spicules.

*Legs* and palpi spined as in *lacustris*, but the spines are more numerous; moreover the posterior side of the tibia of the 2nd leg is armed with strong short spines, and on the anterior side of the patella, tibia, and protarsus of the 3rd leg the spines are arranged closely together, forming distinct band-like areas; whereas in

<sup>1</sup> By an error in the description (P. Z. S. 1897, p. 731) the anterior median eyes are described in *lacustris* as being separated by a space exceeding twice their diameter; the distance is about equal to a diameter; and the distance between these eyes and the posterior laterals is equal to about twice the diameter of the former.



*lacustris* the spines are relatively few in number and more scattered. Coxæ thickly hairy below, coxa of 3rd with a band of close-set short spikes. Legs 4, 1, 3, 2; tibia of 3rd thick, its width slightly exceeding its superior length; width of femur of this leg about two-thirds its superior length (in *lacustris* barely more than half).

*Measurements in millimetres.*—Total length of trunk 33, of carapace 14 (with mandibles 19); length of palpus 21, of 1st leg 24, 2nd 22, 3rd 23, 4th 31 (all from base of femur); pavela and tibia of 1st 10, of 4th 12; tarsus and protarsus of 4th 10.

*Loc.* Taru and Machuma in the Taru desert (*type*). A female example from each of these localities.

This species and *Acanthodon lacustris*, recently described from Kinyamholo, Lake Tanganyika (P. Z. S. 1897, p. 731), may be distinguished by the following characters:—

- |   |   |
|---|---|
| <p>a. Labial teeth 4-5; external side of tibia of 2nd leg armed with short robust spines; coxæ of legs densely hairy below, that of 3rd leg with an oblong area of close-set spinules; legs shorter, protarsus of 4th rather less in length than twice the width of the ocular area; width of ocular area exceeding by a little the length of the upperside of the 3rd tibia; width of 3rd tibia equal to its length .....</p> <p>b. Labial teeth 2; external surface of 2nd tibia without short stout spines; coxæ of all the legs almost sparsely hairy below; legs longer, protarsus of 4th exceeding twice the width of the ocular area, which is slightly less than the length of the 3rd tibia; width of 3rd tibia exceeding its length .....</p> | <p><i>robustus</i>, sp. n.</p> <p><i>lacustris</i> Poc.</p> |
|---|---|

It appears to me impossible to say whether the species described by Gerstäcker as *Idiops compactus* belongs to the genus *Acanthodon* or to the allied genus *Heligmomerus*. It was procured at Dafeta, Kilimanjaro, a locality which at first suggests the possibility of identity between it and *Acanthodon robustus*. But according to Gerstäcker, *compactus* has only a pair of labial teeth as in *lacustris*, and is much smaller than *robustus*, the total length of carapace and mandibles being 13.5 mm. Moreover the legs of the 3rd pair are said to be shorter than the rest, and the palpi as long as the legs of the 1st pair—characters which do not apply to *robustus*.

## Family ARGIOPIDÆ.

### Genus NEPHILA Leach.

#### NEPHILA MADAGASCARIENSIS (Vinson).

*Epeira madagascariensis*, Vinson, Aranéides des Iles Réunion, Maurice et Madagascar, p. 191, pl. vii. (= *N. argyrotoxa* Gerst.).

*Loc.* Maziwa Mitatu in the Taru desert.

Widely distributed throughout East Africa.

#### NEPHILA SUMPTUOSA Gerstäcker.

*Nephila sumptuosa*, Gerstäcker, Von der Decken's Reisen in Ost-Afrika, iii. 2, p. 501, pl. xviii, fig. 12.



*Loc.* Mgana, Maziwa Mitatu, Marago-ya-Fundi.

This species has a wide range throughout East Africa and is also abundant in Socotra. Fortunately the admirable figure of it published by Gerstcker makes the identification of the species a matter about which there can be little doubt.

*NEPHILA PILIPES* (Lucas).

*Epeira pilipes*, Lucas, Thomson's Arch. Ent. ii. p. 416, pl. xiii. fig. 7 (1858).

*Loc.* Taru.

Abundant throughout tropical Africa and extending as far south as Cape Colony.

Genus *ARANEUS* Linn.

(= *Epeira* of authors.)

*ARANEUS NAUTICUS* (L. Koch).

*Epeira nautica*, L. Koch, Aegyptische und Abyssinische Arachniden, p. 17, pl. ii. fig. 2 (1875).

*Loc.* Taru.

Almost cosmopolitan in range.

? *ARANEUS SIMILIS* (Bsenberg and Lenz).

*Epeira similis*, Bsenberg and Lenz, Jahrb. Hamb. Wissen. Anst. xii. p. 20, pl. ii. figs. 26-26 b.

? *Epeira suedicola*, Simon, Ann. Soc. Ent. Fr. (6) x. p. 103 (1890).

An adult male and a mutilated female from Changamwe and an immature female from Taru are doubtfully referred to this species, recorded by its describers from Quilimane. Judging by the form of the vulva, *A. similis* and *A. striata* of Bsenberg and Lenz are closely allied to *A. suedicola*, which Simon recorded from Arabia and which Pavesi has since recorded from Somaliland (Ann. Mus. Genova, xxxv. p. 498, 1895).

*ARANEUS ERESIFRONS*, sp. n. (Plate XLI. figs. 3-3 b.)

*Colour.* Carapace reddish brown, blackish on the head-region, hairs whitish; mandibles blackish brown; sternum, labium, and maxillae brown; legs with coxae and trochanters reddish yellow, rest of legs reddish yellow, with the greater part of the femora and the distal end of the tibiae blackish, hairs white; palpi yellowish red; abdomen nearly uniform cream-white on the upperside, with four sigilla showing as brown spots, sometimes with fine darker longitudinal lines on the posterior part and fine indistinct yellowish vertical lines at the sides; fore part of abdomen deep black, with a transverse white stripe; this black, becoming gradually paler, spreads backwards and downwards over the whole of the sides and lower surface of the abdomen as far back as the spinners, which are themselves brown; the area between the spinners and the epigastric fold a little darker and ornamented with four white spots, one on each side behind the lung-books, the others farther back and closer together in front of the spinners.

*Head* strongly elevated, convex from before backwards and from side to side. Ocular quadrangle much wider in front than behind; the anterior median eyes much larger than the posterior median and more widely separated, distance between posterior medians barely equal to their radius, distance between anterior medians nearly equal to their diameter, distance between anterior and posterior medians about equal to diameter of anterior; eyes of anterior line slightly procurved when viewed from the front, the centres of the medians about on a level with the upper edge of laterals, which are about their own diameter above the edge of the clypeus.

*Mandibles* armed with three posterior and three anterior teeth. Spines on legs few in number and black.

*Abdomen* voluminous, rounded, without shoulder-points, a little wider than long, widely rounded, not pointed posteriorly. *Vulva* when viewed from below forming a pair of pit-like depressions separated in the middle line by the scape, which, broad and wrinkled at the base, passes backwards, then takes an abrupt curve, the apical piece being bent at right angles to the basal portion.

*Measurements in millimetres*.—Total length 11; length of abdomen 8.5, width 9.

*Loc.* Taru.

The Museum has also received this species from the following localities in East Africa:—Karagesi (*Emin Pasha*); Mombasa (*W. E. Taylor*); Leikipia (*J. W. Gregory*). The specimen selected as the type is one of those from Karagesi.

In form and colouring, especially of the abdomen, this species closely resembles the Australian species *Epeira albida* of L. Koch (Die Arachniden Austral. i. p. 83, pl. vii. fig. 2), with which *Epeira locuples* of Butler (P. Z. S. 1879, p. 732, pl. lviii. fig. 2) from Madagascar is apparently identical. The form of the vulva in *A. eresifrons* is, however, quite different from that of *albidus*, and the latter has not the strongly elevated head characteristic of the former.

According to Simon's divisions of the genus *Araneus* this species falls into Section 3, except that the anterior line of eyes is slightly procurved rather than recurved.

*ARANEUS BETTONI*, sp. n. (Plate XLI. figs. 4, 4 a.)

*Colour*. Carapace mahogany-red, black at the sides and on the face, clothed with white hairs; mandibles yellow in front at base, black at apex and along their outer surface; palpi ochre-yellow, with patella, tibia, and tarsus infusate distally; legs variegated, femora mostly black, those of the 3rd and 4th legs with two yellow rings, one basal, the other submedian; of the 1st less distinctly annulate, reddish below and internally; patella black below, reddish brown above; tibiæ yellowish red, blackish at apex, that of 2nd leg also with a broad black basal patch below; protarsi yellow, black at apex; abdomen deep blackish brown above, with broad paler band along middle line; sides of abdomen lighter than upper surface,

yellowish brown, and ornamented below with jet-black irregular transverse stripes, which below become blended with the darker tint of the inferior surface, area between spinners and epigastric fold black; anterior spinners black, posterior reddish; coxæ reddish black; sternum black, with a pale narrow median line.

*Carapace* with cephalic region moderately elevated, only lightly convex above; carapace a little longer than upperside of tibia of 1st leg, its width just about equal to tibia of 2nd leg. Eyes of anterior line very slightly procurved, centres of medians on a level with upper edge of laterals; median quadrangle wider in front than behind; anterior medians about a diameter apart and a little farther from the posterior medians; posterior medians less than a diameter apart.

*Mandibles* with four anterior and three posterior teeth. Spines on legs numerous and strong.

*Abdomen* broader than long, voluminous, without shoulder-points, its anterior border widely rounded, its posterior widely ovate. *Vulva* consisting of a simple stout vertical rod, with its apex bent at right angles to the basal portion.

*Measurements in millimetres*.—Total length 16; length of carapace 6.5, of abdomen 10.5; width of abdomen 11.2; length of anterior leg 25, of posterior leg 23.

*Loc*. "88 miles inland from Mombasa." A single female.

Allied to *A. nauticus*, but much larger and with wider abdomen and the distal end of the vulva bent at right angles instead of nearly straight.

*ARANEUS TARUENSIS*, sp. n. (Plate XLI. fig. 5, and Plate XLII. fig. 1.)

*Colour*. Carapace testaceous, infusate laterally; mandibles, palpi, and maxillæ testaceous; sternum testaceous in the middle, brown at the sides; legs testaceous; femora of first three pairs with a fuscous patch at the distal end, of 4th pair with a median fuscous patch as well; 3rd and 4th legs also infusate at distal end of patella and tibia and at the middle of pretarsus and on tarsus, these patches less evident on legs of 1st and 2nd pairs; abdomen ochre-yellow above, speckled with minute red lines and spots, a distinct folium consisting of a zigzag black line on each side extending from the median sigilla to the apex; area between the four central sigilla divided by a narrow median black line, branching at the sides; anterior portion of abdomen with a sooty-black patch on each side continuous with the lighter blackish-grey tint of the lateral surface, lower surface ochraceo-fuscous, with a pair of large yellow spots behind the middle line in front of the spinners; hairs mostly white; spines on legs black at base, pale distally; hairs on sides of abdomen golden yellow or reddish.

*Carapace* shorter than 1st tibia, its width less than 2nd tibia, moderately elevated as in *A. bettoni*. Eyes of anterior line slightly recurved or very nearly quite straight; median quadrangle narrowed in front, longer than wide, but the eyes composing it



subequal in size; the anterior eyes a diameter apart, the posterior half a diameter. Mandible with 4 teeth in front and 3 behind.

*Abdomen* widely rounded in front, narrowly ovate behind, longer than broad, without distinct shoulder-points, but prominent in this region. *Vulva* formed on the same general plan as in the preceding species, though differing in structural details.

*Measurements in millimetres*.—Total length 11.5; length of carapace 5, of abdomen 8; width 7.

*Loc. Taru*. A single adult female.

Also allied to *A. nauticus*, but differing in the form of the vulva and in colour.

#### Genus CYRTOPHORA Simon.

##### CYRTOPHORA CITRICOLA (Forsk.).

*Aranea citricola*, Forsk. Descr. Anim. p. 86 (1775) (and all recent authors).

*Loc. Taru*.

Common throughout the tropics of the Eastern hemisphere.

#### Genus ARGIOPE Aud.

##### ARGIOPE NIGROVITTATA Thor.

*Argiope nigrovittata*, Thor. Œfv. K. Vet.-Akad. Forh. 1860, p. 300; Eug. Resa, Arachn. p. 31 (= *caudata* Blackw., and *suavissima* Gerst.).

*Loc. Samburu, Taru*.

##### ARGIOPE LOBATA (Pallas).

*Aranea lobata*, Pallas, Spicil. Zool. i. pt. 9, p. 46, pl. iii. figs. 14–15 (1772).

*Loc. Samburu*. A single immature female referable either to this species or to the closely allied *A. clathrata* C. Koch.

ARGIOPE AUROCINCTA, sp. n. (Plate XLI. figs. 6, 6a, and Plate XLII. fig. 11.)

*Colour*. Carapace ochre-yellow, with radially arranged fuscous spots, covered with silver-white hairs; mandibles and palpi flavous; maxillæ and labium flavous, black at the base; sternum with a broad median flavous band with radiating yellow spots, black at the sides; legs yellow, strongly ringed with black; coxæ with two black spots, femora with three broad black bands, patellæ with a dark distal band, tibiæ with a basal, a median, and an apical black band, protarsi also with three bands, tarsi dark, basally flavous. *Abdomen* ferruginous along the anterior border, with three transverse silvery bands with straight anterior and sinuous posterior border—the anterior just behind the shoulder-points, the median in front of the middle of the upper surface, the posterior behind the middle, the bands scarcely extend on to the sides, the median and posterior ending in a slight enlargement; the median and posterior are defined in front by a narrow dark border and behind



by a transverse black stripe; the areas between these bands rusty red, the whole of the posterior third of the upper surface also rusty red; sides and lower surface deep black, marked with small white spots and furnished with a pair of white internally and externally digitate stripes, passing from the epigastric fold to a point on each side of the red mamillæ; area between the mamillæ and the apex of the abdomen deep black.

*Carapace* heart-shaped, broad, considerably broader than long, its length equal to tibia of 2nd leg, longer than tibia of 4th and than patella and tibia of 3rd, its width equal to length of 4th protarsus.

*Legs* not plumose, without spiny band on the posterior femora.

*Abdomen* truncate in front, with distinct shoulder-points, oval behind, with evenly convex margins converging to a point, in no sense dilated behind, with borders not lobate, about one-fourth longer than wide. *Vulva* consisting of a smooth upstanding posteriorly narrowed tubercle, the posterior border of which is mesially grooved and behind forms a wide septum between the normal arched spaces.

*Measurements in millimetres*.—Total length 14; length of carapace 5, width 6; length of abdomen 10, width 7.5; length of 1st leg 23, of 2nd 23, of 3rd 15, of 4th 21.

*Loc.* Samburu. A single adult female.

In the form of the abdomen this species approaches many of the Oriental species of the genus *Argiope* (e. g. *etherea* Walck.), but differs from all with which I am acquainted in the pattern of the abdomen &c.

#### Genus ARGYROEPEIRA Emerton.

##### ARGYROEPEIRA UNGULATA (Karsch).

*Meta unguolata*, Karsch, Zeitschr. gesamt. Naturwiss. lii. p. 834 (1879).

*Loc.* Taru.

This species, recorded originally from the Loango coast, is widely distributed throughout tropical Africa.

#### ? Genus SALASSINA Simon.

##### SALASSINA FORMOSA (Karsch).

*Cyclosa formosa*, Karsch, Zeitschr. gesamt. Naturwiss. lii. p. 835 (1879).

*Loc.* Samburu and Taru.

Recorded from the Loango coast by Karsch. The British Museum also has examples from the Camaroons (*H. H. Johnston*).

#### Genus POLTYS C. Koch.

##### POLTYS CORTICOSUS, sp. n. (Plate XLII. figs. 12, 12 a.)

*Colour*. Thoracic region of carapace deep reddish brown, cephalic yellowish white; mandibles nearly black; sternum, coxæ, and palpi

tawny brown, femora of anterior legs deep reddish, with a steel-blue anterior distal band; femur of 3rd leg with the steel band on the posterior side; of 4th almost entirely steel-blue, the distal end only pale; patella of 2nd, 3rd, and 4th brown below, of 1st paler coloured; tibiae with a black or deep brown spot at the distal end below, also with a median spot, stronger on those of the 2nd and 3rd pairs; protarsi with two broad bands on the distal half of the lower surface, which on the 3rd and 4th pairs fuse into a continuous broad black band; tarsi black at the distal end below; upperside of legs from patella to tarsus clothed with greyish-yellow hairs, indistinctly variegated with brownish spots, which take the form of definite bands on the tarsi and protarsi and on the distal end of the tibia and patella of the 4th and less distinctly so of the 3rd; epigastric region of abdomen and an area of corresponding size above and at the sides of the pedicel black; upperside of abdomen rusty brown, with a deep chocolate patch in the centre; the sides and tubercles silvery yellow, variegated with lights and shades; lower side of abdomen behind epigastric fold yellowish brown.

*Carapace* a little longer than patella and tibia of 3rd leg, a little shorter than those of 4th; ocular quadrangle nearly square, its length considerably less than height of clypeus.

*Abdomen* nearly parallel-sided, with rounded posterior end, moderately high, its upper surface tolerably flat in the middle but beset with varying sized tubercles, furnished anteriorly with three large tubercles, one in the middle line, and a considerably larger one on each side, which are themselves beset with smaller tubercles.

*Measurements in millimetres.*—Total length 12; length of carapace 6.5, width 5; length of 1st leg 22, 2nd 21, 3rd 15, 4th 18; length of abdomen from base of median tubercle 9, width 7, height from lower side of pedicel to base of lateral tubercle 6.

*Loc.* Maziwa Mitatu in the Taru desert.

This species falls into the section of which *P. illepidus* C. Koch is an example, and is perhaps allied to the W. African *P. monstruosus* Simon, which is unknown to me.

#### Genus CÆROSTRIS Thorell.

##### CÆROSTRIS NODULOSA, sp. n. (Plate XLI. fig. 7.)

*Colour.* Carapace black, or reddish brown in younger specimens, its posterior slope reddish brown; cephalic region covered with a clothing of whitish hairs, intermixed here and there with yellow or mostly yellow, mottled greyish patches at the sides and along the middle line; mandibles black or brown, covered with yellowish-brown hairs intermixed with white; upperside of legs from patella to tarsus covered with silvery white hairs, variegated with patches of yellow or yellowish grey, the darker patches being traceable upon the distal end of the patella, tibia and protarsus, and even the middle of the tarsus; on the 3rd and 4th protarsus the darker patch is in the middle of the segments; femora naked, except at the distal end, and in maturer forms steel-blue in colour;

legs banded below almost as in *C. sexcuspidata* (Fabr.), the black band on the protarsus of 1st and 2nd not extending to apex of segment as it does in *mitralis*, and not or hardly wider than the apical white spot on the protarsus of the 4th. Abdomen coloured below as in *mitralis*, a uniform greyish-brown with a narrow transverse stripe behind the epigastric fold, the upperside covered with a clothing of greyish-white hairs, variegated at the sides and behind with brown patches and lines, sometimes with a transverse mesially interrupted brown stripe behind the anterior of the median sigilla, and with sometimes a median brown band extending to the spinners from the posterior pair of large sigilla.

*Carapace* with its dorsal and lateral tubercles subequal in size; the length of the carapace equal to protarsus and half the tarsus of 1st leg, almost equal to protarsus and tarsus of 4th; width of the head a little less than length of carapace.

*Abdomen* about as broad as long; tubercles very variable in size, but the same in number as in *C. mitralis*; of the six forming the anterior series those constituting the median pair are closer together than either is to the adjacent tubercle on its outer side; the three shoulder-tubercles sometimes raised into a conspicuous hump, sometimes produced into a longish pointed process, sometimes quite small, the median tubercles between them also either scarcely projecting above the level of the integument or forming a pointed conical process; the four posterior tubercles distinct, but not large.

*Vulva* consisting of a black tubercle, the anterior half of which is deeply grooved mesially; the posterior half excavated, the excavation divided by a median longitudinal ridge; the posterior rim of the excavation mesially elevated, its anterior rim formed by the posterior edge of the anterior sclerite, forming two arches; the little spinuliform processes which arise from the front edge of the vulva are widely separated at the base, are directed backwards with a slight outward curvature, but their tips do not reach the anterior arched border of the excavation.

♂. Much smaller than ♀; the tubercles of the carapace small, especially the lateral; legs red in colour and less distinctly banded than in ♀; upperside of abdomen subcircular with truncate anterior border, convex from before backwards, without tubercles, with a large anterior median and three pairs of large sigilla arranged in two longitudinal series, also with marginal sigilla.

*Measurements in millimetres.*—♀. Total length 22; length of carapace 9; width of head 8.5; length of abdomen 16, width 16.5; length of 1st leg 29, of 4th 27.

♂. Total length 7; width of head 3.5; length of abdomen 5.5, of 1st leg 13.5, of 4th 11.

*Loc.* Samburu, Taru, and Marago-ya-Fundi (in the Taru desert).

Perhaps identical with the species which Gerstäcker identified as *C. mitralis* Vinson (Von der Decken's Reisen etc. iii. pt. 2, p. 491), or perhaps with that from Shoa determined as *C. mitralis* by Pavesi (Ann. Mus. Genova, xx. p. 8); but certainly



different from Madagascar examples in the British Museum which I refer to *C. mitralis*. It also differs apparently from *C. rugosa* Karsch, from Inhambaue in Mozambique (Mon. Ak. Wiss. Berlin, 1878, p. 323, pl. i. fig. 8), at least in the form of the vulva, which Karsch declares to resemble in his species that of *C. mitralis*; and lastly, judging from the description of *C. simata* Bösenberg & Lenz, from Quilimane and Pangani (Jahrb. Hamb. Anst. xii. p. 46, pl. ii. fig. 27, 1896), it differs from that species at least in the following particulars: the equality in size between the dorsal and lateral tubercles of the carapace, the distinctness of the dark naked lines upon the patellæ and tibiæ of the legs, and the absence of the cherry-red patch of colour by the vulva, which was present in all the examples of *simata*. The figures of the vulva of the last-named species afford scarcely any help towards its identification.

### Genus GASTERACANTHA Sundevall.

#### GASTERACANTHA RESUPINATA Gerstäcker.

*Gasteracantha resupinata*, Gerstäcker, Von der Decken's Reisen in Ost-Afrika, iii. 2, p. 490, pl. xviii. fig. 8.

*Loc.* Maziwa Mitatu and Machuma (Taru desert).

This species is sometimes cited as synonymous with *G. falcicornis* of Butler, which has priority. The two are, however, I think distinct, the red bands on the abdomen in *resupinata* being absent in *falcicornis*.

#### GASTERACANTHA TABULATA Thor.

*Gasteracantha tabulata*, Thorell, Öfv. K. Vet.-Akad. Forhandl. xv. p. 303 (1859); id. Eugenes Resa, Arachnida, p. 23.

*Loc.* Machuma, Maziwa Mitatu (Taru desert).

Extends as far to the south as the Transvaal and Natal.

### Family ERESIDÆ.

#### Genus STEGODYPHUS Simon.

##### STEGODYPHUS LINEIFRONS, sp. n. (Plate XLII. fig. 13.)

*Colour.* Carapace castaneous, thickly clothed with white hairs intermixed with others of a yellower hue; a narrow black transverse stripe running from the antero-lateral eye on each side to a point on a level with the posterior median eye; upper basal half of mandibles clothed with white hairs, lower or distal half with blackish-brown hairs; legs clothed with yellowish-white hairs, the inner and under side of the femur and tibia of the 1st leg deep velvety black, and the inner surface of the femur and the inner half of the tibia of the 2nd also velvety black; tarsi and protarsi in part infusate; a blackish-grey patch on the posterior (inner) side of the 4th protarsus; entire upperside of abdomen ochre-yellow, covered with short white hairs, the lower side variegated with pale brown, with a patch of black hair upon the vulva and black shining mamillæ.

*Carapace* equal to patella and tibia and almost half protarsus



of 1st leg and a little longer than patella, tibia, and half protarsus of 4th, longer than protarsus and tarsus of 1st, than tibia, protarsus, and tarsus of 2nd, and than patella, tibia, protarsus, and tarsus of 3rd, and just about equal to tibia, protarsus, and tarsus of 4th; width of cephalic region exceeding length of 1st protarsus and just about equal to tarsus and protarsus of 4th.

*Vulva* as in figure.

*Measurements in millimetres.*—Total length 15; length of carapace 7·3; width of head 4·3; length of 1st leg 16, of 2nd 12, of 3rd 10, of 4th 14·5.

*Loc.* Mbuyuni. A single adult female.

Evidently nearly related to *Stegodyphus africanus* of Blackwall from the Zambesi region (Ann. Mag. Nat. Hist. (3) xviii. p. 453, 1866), but apparently differing in having the hairs on the upper half of the mandible white instead of reddish yellow, in the presence of the narrow dark transverse line on the face, and in the absence of a dark sinuous stripe on each side of the middle line of the dorsal side of the abdomen. From *S. mimosarum* Pavesi (Ann. Mus. Genova, xx. p. 81, 1884), from Shoa, *lineifrons* also differs in the absence of the abdominal bands and the presence of the facial line, and also apparently in the coloration of the 2nd leg.

*STEGODYPHUS BETTONI*, sp. n.

*Colour.* Carapace clothed with black hair, with a marginal border of white hairs extending from the antero-lateral eye, and a wide white, irregularly oblong, patch occupying the upper and posterior portion of the cephalic region, and breaking up in front into narrow stripes, of which one on each side extends forwards as far as the posterior median eye; mandibles black, their basal half marked with a transverse white stripe, separated by a space about equalling its own width from the edge of the clypeus: legs variegated with incomplete rings of brown and white; femora of 1st and 2nd blacker, with snow-white patches: abdomen testaceous, covered above with yellow hairs, without clearly defined longitudinal black bands; black below, and variegated with white patches.

Length and width of carapace as compared with legs almost the same as in the preceding species, the legs being slightly longer.

*Measurements in millimetres.*—Total length 11; length of carapace 4; width of head 2·3; length of 1st leg 8·5, of 2nd 6·5, of 3rd 5·1, of 4th 8.

*Loc.* Samburu.

Although the single example of this species that was obtained is an immature female, I have not hesitated to describe it, the females of this genus being generally readily recognizable by colour-characters; and since these characters are not, within my experience, subject to much variation with growth, there is no reason for supposing that the adults will differ from the immature type specimen of the species in any important character but size.

*S. bettoni* may apparently be recognized from the rest of the known tropical African species by the colouring of the carapace and mandibles.

## Family PISAURIDÆ.

## Genus TETRAGONOPHTHALMA Karsch.

TETRAGONOPHTHALMA STUHLMANNI Bösenb. &amp; Lenz.

*Tetragonophthalma stuhlmanni*, Bösenb. & Lenz, Jahrb. Hamb. Anst. xii. p. 37, pl. ii. fig. 19.*Loc.* Taru and Samburu.

Two male examples belonging to this or to a nearly allied species.

## Genus THALASSIUS Simon.

THALASSIUS MARGARITATUS, sp. n. (Plate XLI. fig. 8.)

*Colour.* Carapace a dark mahogany-brown, with a broad, completely marginal yellowish-white band, which in front runs up to a point on a level with the anterior median eyes: abdomen a rich olive-brown above, ornamented on each side with a broad yellow lateral stripe, geniculate at its posterior end where it embraces the abruptly narrowed posterior termination of the dark coloured field of the upper surface; four yellowish-white spots on the upper (inner) margin of each stripe, the posterior spot the largest and situated just in front of the geniculation of the lateral band; lateral surface below the band greyish white in front: legs and lower surface a tolerably uniform yellowish or greyish brown.

*Carapace* a little shorter than tibia 1, and about as long as protarsus 1, its width a little shorter than tibia 3; ocular quadrangle a little longer than wide, parallel-sided, the eyes composing it subequal; clypeus equal to about once and a half times the length of the quadrangle; anterior lateral eye nearer to the anterior median than to the posterior lateral.

*Legs* 4, 1 and 2, 3; patella and tibia of 1st distinctly shorter than of 4th, scarcely exceeding those of 3rd.

*Abdomen* truncate in front, pointed behind, broadest just behind the middle.

*Measurements in millimetres.*—Total length 21; length of carapace 9, width 8; length of 1st leg 33, of 2nd 34, of 3rd 32.5, of 4th 38.5; patella and tibia of 1st 12, of 4th 13.5.

*Loc.* Samburu and Taru.

Differing from the rest of the African species with which I am acquainted in the pattern of the abdomen and the marginal white thoracic band.

## Family CTENIDÆ.

## Genus CTENUS Walck.

CTENUS CARSONI F. Cambr.

*Ctenus carsoni*, F. Cambr. Proc. Zool. Soc. 1898, p. 24, pl. iii. figs. 4, 5.*Loc.* Taru and Mgana.

Apparently widely distributed in East Africa.

## Family HETEROPODIDÆ.

## Genus HETEROPODA Latr.

## HETEROPODA VENATORIA (Linn.).

*Loc.* Changamwe.

Introduced by human agency throughout the world, originally from the Oriental region.

## Genus SPARASSUS Walck.

## SPARASSUS BICORNIGER, sp. n. (Plate XII. fig. 9.)

*Colour* of carapace, mandibles, sternum, coxæ, and maxillæ a uniform bright ochre-yellow, the sternum rather paler than the coxæ and carapace; legs of the same tint, but with the femora rather thickly spotted below; tarsus and tibial spines of palp black; hairy clothing of legs and carapace, where present, of a silvery white; abdomen damaged, but distinctly spotted above, the sides variegated with yellowish hairs.

*Carapace* about equal to length of 4th tibia, very slightly longer than wide, strongly convex; posterior line of eyes straight, the eyes subequal, the medians nearer together than either is to the corresponding lateral; ocular quadrangle longer than wide: eyes of anterior line straight, larger than those of the posterior, subequal in size and subequally spaced; distance between the medians less than a diameter, medians about their own diameter from edge of clypeus.

*Legs* 2, 1, 4, 3; patella and tibia of 1st longer than of 4th; protarsi of 1st, 2nd, and 3rd scopulate only in the distal third of their length, 4th not scopulate; patellæ unspined, spines on lower side of tibiæ and protarsi 2, 2, on upperside of tibia 1, on upperside of femora in the middle 2.

*Palp* with tibia and patella subequal in length; tibia much thickened below at its distal end, armed externally with a long, straightish, slightly clavate process, which considerably exceeds the tibia in length and gives off near its base in front a thinner curved pointed process nearly equal to the tibia in length; tarsus rather longer than patella and tibia, with a narrow stalk-like neck and a posterior external angular expansion, its inner margin evenly convex, gradually narrowed to the tip.

*Measurements in millimetres.*—Total length 10; length of carapace 4·8, width 4·3; length of 1st leg 22, of 2nd 24, of 3rd 17·8, of 4th 20.

*Loc.* Ndi, Weiss Road.

This peculiar species is sufficiently characterized by the structure of its double tibial apophysis of the palp.

## Order SOLIFUGÆ (SOLPUGAS).

## Family SOLPUGIDÆ.

## Subfamily RHAGODINÆ.

## Genus RHAGODES Pocock.

## RHAGODES ORNATUS (Poc.).

*Rhax ornatus*, Poc. Ann. Mag. Nat. Hist. (6) xvi. p. 93, pl. iv. fig. 2.

*Loc.* Maziwa Mitatu and Samburu.

Described from Mombasa.

## Subfamily SOLPUGINÆ.

## Genus SOLPUGA Licht.

## SOLPUGA SEMIFUSCA, sp. n.

*Colour.* Palpi and limbs a uniform reddish or ochre-yellow; upper surface of mandibles and cephalic plate a very deep olive-brown or black; sides of the mandibles yellow, contrasting sharply with the dark tint of the upper surface; the whole of the upper-side of the abdomen dark; the whole of the lower surface pale.

*Head-plate:* width a little less than length of tibia of palpus or of 4th leg, exceeding the 4th protarsus by about one-third of the tarsus, less than protarsus and tarsus of palp by half the tarsus.

Dentition of *mandible* as in *S. brunnipes*, the small tooth on the upper jaw following the second indistinctly double.

*Measurements in millimetres.*—Total length (including mandibles) 53, without mandibles 40; width of head 10·6; length of palpus 35, of 1st leg 29, 2nd leg 26, 3rd leg 33·5, 4th leg 54; tibia of palp 11, its tarsus and protarsus 12; tibia of 4th leg 11, protarsus 10.

*Loc.* Voi (*type*) and Samburu.

Without knowing the male characters it is not possible to satisfactorily determine the position of this species. In general aspect it is much like *brunnipes* of Dufour; but differs from the specimens of that species known to me—namely, one example from Algeria and one from Somaliland (*Donaldson Smith*)—in having the head and upper surface of the jaws of a uniform blackish tint, *brunnipes* being uniformly ochre-brown in these parts.

*S. merope* of Simon (Ann. Soc. Ent. France, 1879, p. 112), from Zanzibar, may be allied to this form; but I know nothing of the proportion of the limb-segments to the head. Possibly the type of *merope* is young, but, if not, the species is much smaller than *semifusca*, measuring only 26 mm. in total length; and, lastly, the 4th legs are described as being infusate at least in part.

## SOLPUGA ZEBRINA, sp. n.

So closely allied to *S. sericea* Pocock, from Gadzima on the Umfuli River in Mashonaland, 4200 ft. alt. (Ann. Mag. Nat.



Hist. (6) xx. p. 260, fig. 4), that no detailed description is necessary; the principal difference lying in its much smaller size, the adult male measuring with the mandible only 18 mm., whereas *S. sericea* is as much as 30. Moreover, although the tergal plates of the abdomen in *zebrina* are narrowly margined with black with a broad black median dorsal band, there is on each side of the latter a conspicuous broad yellow stripe, each being almost half the width of the median black stripe. In *S. sericea* the corresponding yellow stripe is very narrow in comparison.

*Measurements in millimetres.*—♂. Total length of trunk 15, with mandibles 18; width of head 3; length of palp 17, of 1st leg 16, 2nd leg 13, 3rd leg 17.5, 4th leg 29; tibia, protarsus, and tarsus of palp 5.5; tibia of 4th leg 5, protarsus 5.5.

*Loc.* Maziwa ya Tagari, in the Taru desert.

Two male examples.

#### Genus ZERIASSA Pocock.

*Zeriassa*, Pocock, Ann. Mag. Nat. Hist. (6) xx. p. 255 (1897).

ZERIASSA SPINULOSA, sp. n. (Plate XLII. fig. 15.)

*Colour.* Upperside of mandible, head, thorax, and abdomen a uniform reddish or earthy brown; two indistinct darker stripes on the mandible; ocular tubercle black, only the tips of the fangs reddish brown; palp with tibia, protarsus, and distal third of the femur black; tarsus and basal two-thirds of the femur clear yellow; the joints between the femur, tibia, and protarsus slightly paler; 1st and 2nd legs yellow, with the exception of the fuscous distal end of the femur; 3rd and 4th legs also with the tibia distally black and the femur lightly infuscate, the rest of these limbs pale; lower surface of thorax and abdomen pale.

*Head-plate* equalling in width about two-thirds the length of the tibia of the palp and five-sixths the length of the protarsus of the 4th leg, as long as the tibia and one-third of the protarsus of the 3rd leg; studded with spinules; ocular tubercle prominent, high and wide.

*Mandibles* inflated, abruptly narrowed at the base of the fang, armed with longish spines above, the upper fang projecting far beyond the base of the flagellum, armed with a series of seven triangular but not long teeth, the first very small, placed a long distance behind the tip of the fang and close to the second, which is large and just below the base of the recurved portion of the flagellum; third tooth small, nearer to the fourth, which is also large, than to the second, the remaining three small and equally spaced; one small tooth on the inner side nearly on a level with the seventh tooth of the outer series; lower fang armed with three distinct teeth, the first and third subequal, the second smaller and nearer the second.

*Flagellum* with high, convexly rounded membranous portion: the recurved terminal portion short, scarcely surpassing the membranous portion; on the inner side of the upper fang are a couple of stout spines lying below the flagellum.

*Palpi*—femora clavate, furnished with a few short spines and short hairs; tibia narrower at the base, armed below throughout its length with many short spines; protarsus distally narrowed, armed below, like the tibia, with many short spines. In addition to the normal spine-armature, there are a few longish spines on the upperside of the basal segments of the legs.

*Tergal plates* of abdomen and of thorax beset with short spines, of which there is a distinct posterior row.

♀. Not very different from the male in length of limbs, size of mandibles, &c.; but with shorter malleoli; mandibles and head spiny; thorax, abdomen, tibia and protarsus of palp, and basal segments of legs not spiny; mandibles strongly toothed, second tooth twice as long as the first and twice as long as broad, third and fifth teeth small and subequal, fourth tooth large, but shorter than the second; inner row of teeth consisting only of two, one in the same position as in the male, the other considerably lower.

*Measurements in millimetres* of type (♂).—Total length of trunk 14, with mandibles 17·8; length of palp 19, of 1st leg 12, of 2nd leg 11·5, of 3rd leg 17, of 4th leg 26; tibia of palp 6, protarsus and tarsus 6; tibia of 4th leg 6, protarsus 5; width of head-plate 4·5.

♀. Total length of trunk 16, with mandible 21; width of head 4·8; length of palp 18, of 1st leg 11, of 2nd 12, of 3rd 15, of 4th 26; tibia of palp 6, protarsus and tarsus 5·5; tibia of 4th leg 5·5, protarsus 4·5.

*Loc.* Maziwa Mitatu in the Taru desert (*type*); examples also obtained at Machuma in the Taru desert, Mbuyuni and Ndi (Weiss Road).

The two known species of this genus may be readily distinguished as follows:—

- a. Length of trunk 25 mm.; terminal fang of upper jaw projecting a very short distance beyond the flagellum, its second tooth much larger than the rest; a row of 5 stout spines near the base of the flagellum on the inner side; filiform terminal part of flagellum long, far surpassing the membranous basal portion; head, mandibles, upper surface of body, and bases of limbs studded with stout bristles, not spines; femora and tibiae of posterior legs black..... *bicolor* Poc., ♂.
- b. Length of trunk 15 mm.; terminal fang of upper jaw far surpassing flagellum, the second tooth not larger than those behind it; only two spines near the base of the flagellum on the inner side; filiform portion of flagellum scarcely surpassing the membranous basal portion; head, mandibles, and dorsal surface of trunk studded with spines; posterior legs with only the distal end of the femur black ..... *spinulosa*, sp. n.

#### Genus BITON Karsch.

BITON TIGRINUM, sp. n. (Plate XLII. figs. 14, 14 a.)

*Colour* reddish yellow, variegated with deeper brown; head-plate pale in its middle third, brown at the sides, tubercle black;

mandible with two indistinct fuscous stripes above; abdomen trilineate, each tergite marked with a median spot and a marginal spot on each side, the intervening pale area on each side about twice the width of the median spot; palpi with tarsus entirely pale, tibia deep brown, patella paler brown, its distal end and the adjacent end of the tibia narrowly pale; femur very lightly brownish distally; 1st and 2nd legs pale, 3rd with femur and patella lightly brownish (legs of 4th pair absent).

*Head-plate* and mandible covered with a clothing of short hairs intermixed with a few bristles; the former a little excelling in width half the length of the tarsus and protarsus of the palp.

*Palpi* long, as long as the body and mandibles; the tibia furnished with long bristles; the protarsus with five pairs of longish spines, those at the base of the segment setiform.

*Mandibles* elongate; the upper fang slightly sinuous, lightly concave above, rather strongly convex below, then narrowed at the point; the teeth arising rather far back, nearly as far back as the base of the flagellum; the first, second, and fourth long and nearly cylindrical but pointed; the third minute, lying close to the base of the fourth; the rest, three in number, forming the outer series, triangular; the inner basal series also three in number, sharp, the median of the three much the smallest; lower fang long, armed with two strong triangular teeth, and a minute one at the base of the first of these.

*Flagellum* membranous, broad, laminate, and incurled at the base, then passing into a slender terminal portion which passes back and rests on the head at the side of the ocular tubercle.

*Measurements in millimetres.*—Total length (including mandible) 15; length of mandible 4; width of head 3; length of palp 15, its tibia 5; tarsus and protarsus 5.5.

*Loc.* Samburu.

The absence of the 4th leg makes the generic position of this species a little doubtful. It may perhaps prove to be the male of either *B. brunripes* or *B. fuscipes* from Somaliland, but is equally likely to be distinct from both.

### Genus CEROMA Karsch.

CEROMA VARIATUM, sp. n. (Plate XLII. fig. 16.)

*Colour.* Head-plate yellowish, irregularly clouded at the sides with brown, pale quite in the middle, tubercle black; mandibles yellow, with two faint brown stripes; palpi with tibia, protarsus, and tarsus deep brown above, paler below; abdomen with three black bands, each tergite ornamented with a median and a marginal black spot; the yellow area on each side about three times the width of the median stripe; legs yellow, the posterior two pairs lightly brownish.

Differing from *C. johnstoni*, from Nyasaland<sup>1</sup>, in having the



flagellum much longer and projecting back on to the head some distance past the ocular tubercle (in *johnstoni* it only reaches the tubercle), and in the much greater thickness of the upper fang, which though pointed at the apex is strongly elevated and convex above; moreover there is a distinct notch just in front of the first tooth; in the lower fang there is one large rounded tooth showing indistinct division into three, the posterior of which stands up as a triangular denticle. In *johnstoni*, this triangular tooth is relatively very much larger, and the other two are much smaller and more distinct; and in the upper jaw the terminal fang is slender (it is represented as too thick in fig. 1, p. 254, of my paper quoted above) and is lightly curved.

The legs and palpi of this species are also a little longer than in *C. johnstoni*.

*Measurements in millimetres.*—Total length 16; length of mandible 4; width of head 3·8; length of palp 12, its tibia 4, tarsus and protarsus 5; 4th leg 19, its tibia 5, protarsus 3·5.

*Loc.* Samburu. A single male example.

The type of this species may prove to be the male of *C. ornatum* of Karsch, based upon a female 22–23 mm. long from Masailand.

#### EXPLANATION OF THE PLATES.

##### PLATE XLI.

- Fig. 1. *Pterinochilus spinifer*, sp. n., ♂, p. 502. Palpal organ, external view.  
 1 a. " " Anterior leg.  
 2. *Piscenorodes höhneli* (Sim.), ♂, p. 505. Distal segments of palp, external view.  
 2 a. " " Anterior leg.  
 2 b. " " Tibial spur of anterior leg.  
 3. *Araneus eresifrons*, sp. n., ♀, × 2, p. 509.  
 3 a. " " Vulva from the side.  
 3 b. " " Vulva from below.  
 4. " *bettoni*, sp. n., ♀, ×  $\frac{3}{2}$ , p. 510.  
 4 a. " " Vulva from the side.  
 5. " *taruensis*, sp. n., p. 511. Vulva.  
 6. *Argiope aurocincta*, sp. n., p. 512. Vulva from below.  
 6 a. " " Vulva from behind.  
 7. *Cærostris nodulosa*, sp. n., p. 514. Vulva.  
 8. *Thalassius margaritatus*, sp. n., ♀, ×  $\frac{3}{2}$ , p. 518. Extended on a reed.  
 9. *Sparassus bicorniger*, sp. n., p. 519. Tibial processes of palp of male.

##### PLATE XLII.

- Fig. 10. *Araneus taruensis*, sp. n., ♀, × 2, p. 511.  
 11. *Argiope aurocincta*, sp. n., ♀, × 2, p. 512.  
 12. *Poltys corticosus*, sp. n., p. 513. Lateral view of cephalothorax and abdomen.  
 12 a. " " Anterior view of cephalothorax and abdomen.  
 13. *Stegodyphus lineifrons*, sp. n., p. 516. Vulva.  
 14. *Biton tigrinum*, sp. n., ♂, × 3, p. 522.  
 14 a. " " Inner surface of mandible.  
 15. *Zeriassa spinulosa*, sp. n., p. 521. Inner view of mandible of male.  
 16. *Ceroma variatum*, sp. n., p. 523. Inner view of mandible of male.